Women's History Month 2013

WOMEN INSPIRING INNOVATION THROUGH IMAGINATION: CELEBRATING WOMEN IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

Women's History Month 2013

Each year, the National Women's History Project selects a theme that highlights achievements by distinguished women in specific fields.

This year, we honor generations of women who, throughout history, have used their intelligence, imagination, and tenacity to make extraordinary contributions to the Science, Technology, Engineering and Mathematics (STEM) fields.

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Mary G. Ross
Mechanical Engineer

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Mary G. Ross was the first female engineer at Lockheed's Missiles Systems Division (1952) and the first known Native American woman to be an engineer. At Lockheed, Ross designed missiles and rockets, and developed systems for human space flight and interplanetary missions to Mars and Venus. After retiring, she began a second career as an advocate for women and Native Americans in engineering and mathematics.

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Virginia Apgar
Medical Doctor

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Virginia Apgar was the first woman to become a full professor at Columbia University College of Physicians and Surgeons. She designed the first standardized method for evaluating newborns' transition to life outside the womb—the Apgar Score, which increased infant survival rates. A pioneer in anesthesiology, she warned that certain anesthetics used during childbirth could harm infants. She devoted the remainder of her life to the prevention of birth defects through public education and fundraising for research. She became the director at the National Foundation for Infantile Paralysis (now the March of Dimes).

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Susan Solomon
Atmospheric Chemist

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Susan Solomon is a professor of atmospheric chemistry and climate science at Massachusetts Institute of Technology. Her research on chlorofluorocarbons causing the Antarctic ozone hole was the basis of the international treaty that has effectively regulated damaging chemicals. A leader in climate science, her work showed that climate changes due to human-induced increases in carbon dioxide will last for more than a thousand years.

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Julia Morgan
Architect

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Julia Morgan was the first woman admitted to the architecture program at Ecole des Beaux Arts in Paris, and the first woman architect licensed in California. She designed over 700 buildings in California and is best known for her work on the Hearst Castle. Not only did Morgan open the field of architecture to women through her example but she also did so by hiring and training women as artists, drafters, and architects for her projects.

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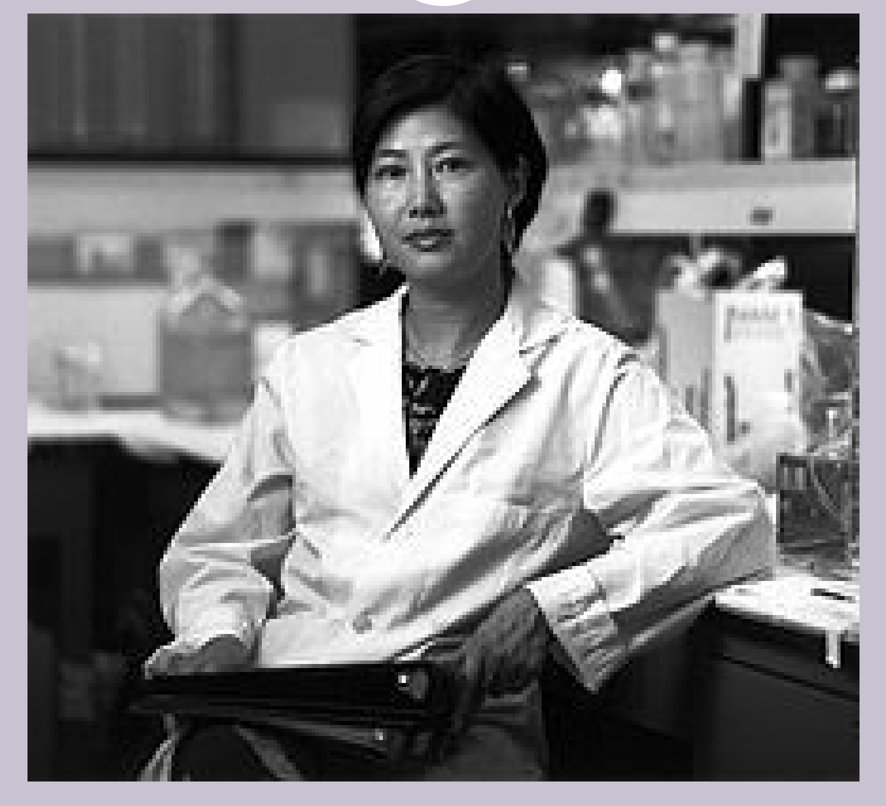
Stephanie L. Kwolek

Ophthalmologist and Inventor

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Stephanie Kwolek created Kevlar, now synonymous with high-tech materials. According to the Kevlar Survivors Club, at least 2,000 lives have been saved by the fiber used in bulletproof vests. Kwolek has received many awards, including induction into the National Inventors Hall of Fame as only the fourth woman member. She received the National Medal of Technology and the Perkin Medal—both honors rarely awarded to women. She has served as a mentor for other women scientists and participated in programs that introduce young children to science.

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Flossie Wong-Staal

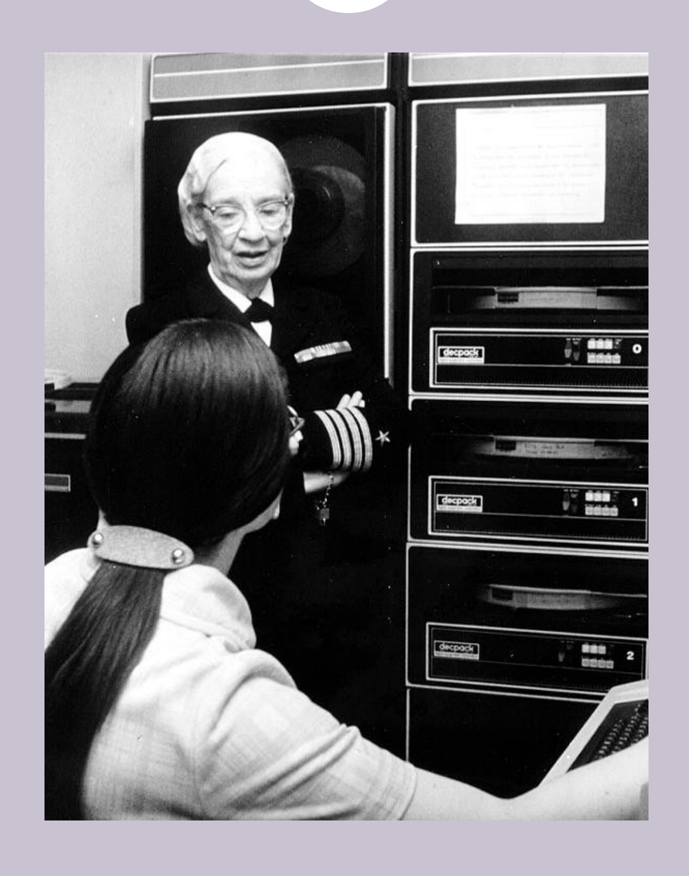
Virologist and Molecular Biologist

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Flossie Wong-Staal is one of the world's foremost authorities in the field of virology. She was a pioneering researcher of retroviruses and with her team identified the HIV virus as the cause of AIDS.

She was the first to clone and complete the genetic mapping of HIV, making it possible to develop HIV tests. Wong-Staal continues her pioneering work in developing first-in-class therapeutics against the Hepatitis C virus.

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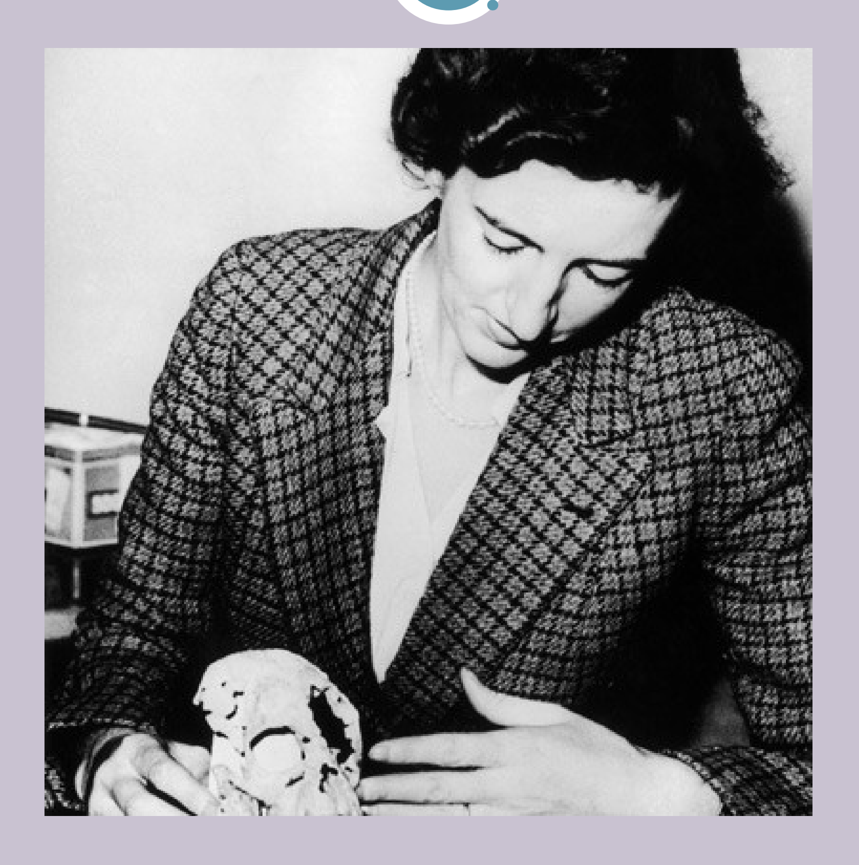
Grace Murray Hopper

Computer Scientist

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Grace Hopper was a pioneering computer scientist and Rear Admiral in the U.S. Navy. Hopper joined the Navy Reserve during World War II and worked as one of the first programmers of the Harvard Mark 1 Computer. Later, she wrote the first computer programming compiler and conceptualized COBOL, one of the first modern programming languages. Upon her retirement, she was awarded the Defense Distinguished Service Medal, the highest non-combat award given by the Department of Defense.

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Mary Douglas Leakey
Paleontologist

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Mary Douglas Leakey was one of the most renowned hunters of early human fossils, credited with discoveries that changed the way scientists conceive human evolution. She and her husband are considered preeminent contributors to the field of human origins. Leakey discovered a hominid skull, which she reconstructed from hundreds of fragments, that dated to 1.75 million years ago, radically changing the concept of the timeline of human evolution.

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Patricia Bath
Ophthalmologist and Inventor

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Patricia Bath's invention of the Laserphaco Probe was a milestone in laser cataract surgery. She was the first woman ophthalmologist at UCLA's Jules Stein Eye Institute and the first Black surgeon at UCLA Medical Center. Bath co-founded the American Institute for the Prevention of Blindness to "protect, preserve, and restore the gift of sight" for all persons, regardless of race, gender, age, or income level. She broke ground for both women and African-Americans in medicine and ophthalmology, and was the first Black woman doctor to receive a patent for a medical purpose.

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Despite the dramatic gains women and girls have made in education since the early 1970s, they continue to be underrepresented in STEM fields and classes.

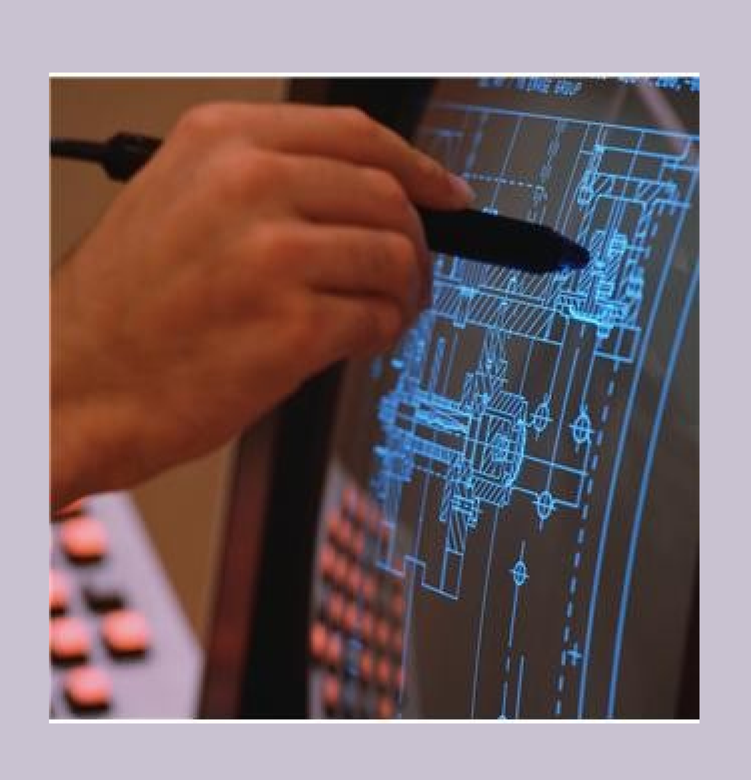
Males continue to earn more credits in physics, computer and information science, and engineering and science technologies classes than females. Overall, males make up over three-quarters of the students enrolled in higher education programs in computer sciences, engineering, and technology.

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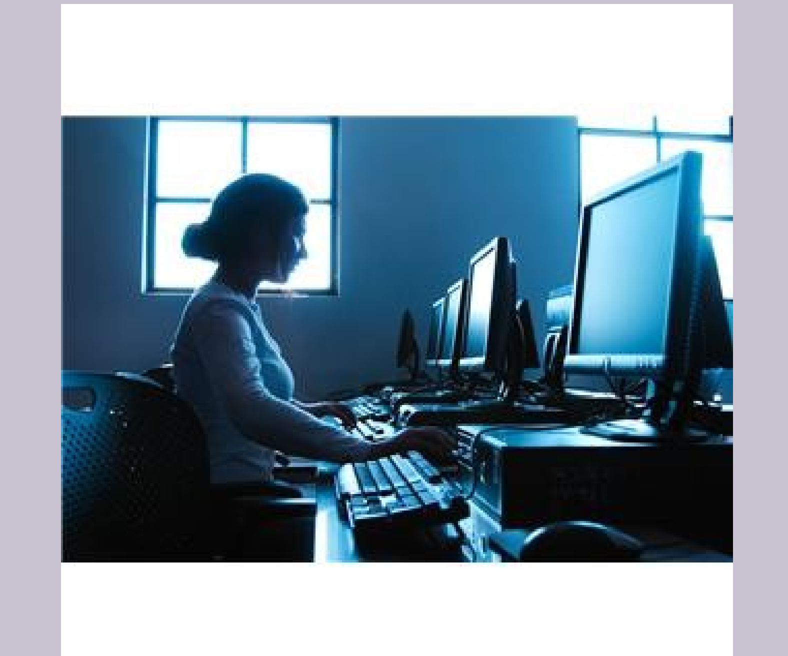
In a recent study of fifteen-year-olds across 34 countries, the United States ranked 14th in science and 25th in mathematics, below countries such as China, Korea, Finland, Japan, Canada, and Estonia.

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While women make up a majority of all college undergraduates and graduate students, in 2009, women earned just 19 percent of physics bachelor's degrees, and received only 16 percent of bachelor's and 22 percent of master's or doctorate degrees in engineering and engineering technologies.

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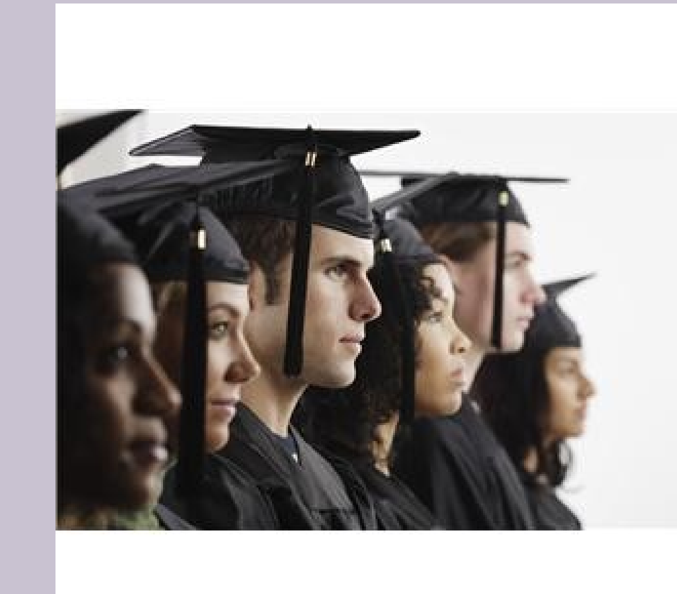
In computer sciences, women's representation has actually been declining. In the late 1980s women earned 32 percent of computer science bachelor's degrees, but by 2009, women's representation dropped to less than 18 percent.

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The underrepresentation of women and girls pursuing STEM subjects has drastic implications for women's economic security, and increasing the number of women who pursue STEM degrees and careers has the potential to decrease the wage gap between men and women.



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Although women fill close to half of all jobs in the U.S. economy, they hold less than 25 percent of science, technology, engineering, and mathematics jobs. This has been the case throughout the past decade, even as college-educated women have increased their share of the overall workforce.

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Women across America are benefiting from efforts to promote STEM degrees and careers because women who hold these degrees and jobs earn 30 percent more, on average, than women in non-STEM jobs.



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For example, in 2012, the median starting salary for a bachelor's degree recipient in marketing was $49,600, compared to $63,000 for a bachelor's degree recipient in chemical engineering.

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A STEM workforce is crucial to America's innovative capacity and global competitiveness. Yet women are vastly underrepresented in STEM jobs and among STEM degree holders, despite making up nearly half of the U.S. workforce and half of the college-educated workforce.

That leaves an untapped opportunity to expand STEM employment in the United States.

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Studies concur that the American workforce needs to produce approximately 1 million more STEM professionals than we are set to produce at current rates.

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The United States needs to tap into the brainpower and innovation of all its people. Removing barriers to women's participation and success in STEM fields will benefit the whole nation.





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"If we're going to out-innovate and out-educate the rest of the world, we've got to open doors for everyone. We need all hands on deck, and that means clearing hurdles for women and girls as they navigate careers in science, technology, engineering, and math."

—First Lady Michelle Obama

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Defense Equal Opportunity Management Institute, Patrick Air Force Base, Florida March 2013

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